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ASSOCIATES INC

LDWSF 12.3.50

02/11/98

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KING COUNTY
INDUSTRIAL WASTE

February 11, 1998

Rick Renaud
King County Industrial Waste
130 Nickerson St., Suite 200
Seattle, WA 98109-1658

Dear Rick,

Thank you for taking the time to discuss the proposed installation for Longview Fibre. I am enclosing the information you requested. We do consider the operational procedures to be proprietary and would appreciate you keeping them confidential. The normal operational pH range in the treatment tank is 5.5-8.5.

If at any time in this permitting process you need additional information please don't hesitate to call me.

Thank you for your time and cooperation.

Sincerely,

Fred Hughes

cc. Tom Craig
Sonny Bivins

USEPA SF



1270072

Wastewater Treatment, Solvent Recycling & Aqueous Cleaning Systems

460 SW Madison Avenue, Suite 13 • Corvallis, Oregon 97333 • Phone 541 758-7321 • FAX 541 754-1849

BECKART ENVIRONMENTAL, INC. RECEIVED

ADVANCED WASTE WATER TREATMENT TECHNOLOGY

4900 46TH STREET KENOSHA, WI 53144 (TEL) 414-654-7680 (FAX) 414-656-7699

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KING COUNTY
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International & Regional Offices

United Kingdom: 44-543-426032	Atlanta: 770-879-8164
Los Angeles: 714-841-0278	Pittsburgh: 412-935-9294
Milwaukee: 414-656-7680	Connecticut: 860-228-7686

BATCH FILTER PRESS CONTROL OPERATING INSTRUCTIONS

Auto BFP w/ DTAM

Process Description:

Waste water is collected in the _____ gallon Equalization tank. To begin treatment, there must be enough water in the Equalization tank to activate the mid-level float switch. The Equalization transfer pump will transfer waste water to the treatment tank. The Equalization transfer pump will turn off when the high level float in the treatment tank is activated (approximately _____ gallons.)

When the treatment tank is full, the treatment mixer will turn on and the recirculation / sludge pump will turn on at approximately 10 psi to recirculate the waste water in the treatment tank. The chemical treatment begins with the addition of coagulant to break the emulsion and lower the pH of the waste water. The coagulant addition is controlled by timer / counter (that can be operator adjusted, counter address C5:2.PRE) and the coagulant pump will shut off when the timer / counter counts out.

After the coagulant addition, the pH buffer pump will turn on, if necessary, and pH buffer will be pumped into the treatment tank. The pH buffer will raise the pH and the pump will turn off when the pH increases to approximately _____ (controlled by relay A on pH meter).

After the pH buffer addition, the polymer pump will turn on. When the polymer pump turns on, the recirculation pump and process mixer will turn off. The polymer addition is controlled by a timer / counter (that can be operator adjusted, counter address C5:3.PRE) and the polymer pump will shut off when the timer / counter counts out. When the polymer addition is complete the treatment mixer will turn on for an additional _____ seconds (Timer address T4:27.PRE). At this point, the treatment process is complete.

After a settling delay (that can be operator adjusted, counter address C5:4.PRE) the decant process begins. When decanting through the filter press, the recirculation ball valve will turn to direct waste water to the press, and the decant ball valve will turn to take water from the decant port. The treated water is pumped from the decant port under low pressure through the filter press. When the water in the treatment tank drops below the mid float level, the decant ball valve will turn and direct waste water from the bottom of the treatment tank to the filter press.

The waste water is first gravity fed into the press for a preset amount of time (that can be operator adjusted, counter address C5:5.PRE). After this time is over, the air regulator / transducer assembly will start the sludge pump at a pressure of 8 psi. The pressure will increase to 20, 30, 40, ..., up to 80 psi as the press cycles. The pressure will increase whenever the pump strokes less than _____ times per minute (counter address C5:7.PRE).

When the press reaches its highest pressure level and the pump does not stroke for 2 minutes, the filter press cycle over light will flash indicating that the filter press should be full. In general, when the filter press is full the water exiting the press will be at a minimum. Once the press is full the air blowdown can be initiated, after which the press may be emptied. (If there is still a decent flow of water exiting the press, this indicates that the press is not full and should be left running.) If there is sludge left in the treatment tank after the press is emptied, it should be pumped to the press before the next batch is treated. See PROCEDURE FOR OPERATION OF THE SYSTEM IN FILTER PRESS MODE.

AUTO RFP WITH DTAM

System Modes

The Batch Treatment System has three "Modes" of operation and processing. They are as follows:

1. **Treatment Mode -** This process is the chemical treatment of the waste water, including the sequencing of the chemical addition and the mixing of the batch.
2. **Filter Press Mode -** This process takes the treated waste water and filters it using air pressure through the Hypack Filter Press. It separates the "sludge" into clean filtrate water and a sludge "Cake".
3. **Continuous Mode -** This process combines both the Treatment Mode and the Filter Press Mode into one running operation. The Programmable Logic Controller (PLC) will switch to the Filter Press Mode after it is done with the Chemical Treatment process.

PROCEDURE FOR OPERATION OF THE SYSTEM IN CONTINUOUS MODE

1. Turn the Mode Select Switch to "OFF".
2. Make sure all switches on the control panel are in the "AUTO" position.
3. Verify that all manual valves are in the proper position to allow for waste water transfer.
4. Clean the pH probe.
5. Verify that all chemical tanks / totes have enough chemical to run a batch. If a low level chemical float is activated during the treatment cycle, the treatment will stop. Once the chemical tank / tote is recharged, you may resume the treatment cycle where it was interrupted by pushing the Treat Start/On (green) button.
6. Verify that the press is closed and has adequate clamping pressure.
7. Reset the Treatment System by pressing both the "Treat Start/On" button and the "Treat Stop/Over" button simultaneously and holding them in until the "Treat Start/On" button flashes on and off for a few seconds. A flashing button will indicate that the Treatment System has been successfully reset.
8. Reset the Filter Press System by pressing both the "Press Start/On" button and the "Press Stop/Over" button simultaneously and holding them in until the "Press Start/On" button flashes on and off for a few seconds. A flashing button will indicate that the Filter Press System has been successfully reset.
9. Turn the Mode Select Switch to "CONTINUOUS".
10. Press the "Treat Start/On" button to start the Continuous Process.
11. Pressing the "Treat Stop/Over" button will halt the system at that point in the treatment process, by disconnecting all of the pending outputs. Pressing the "Treat Start/On" will re-start the system at the point that it was stopped.

TREATMENT PROCESS SEQUENCE DESCRIPTIONS

Equalization Tank Blower / Air Sparge and Transfer Pump - The Equalization air sparge will be enabled when the fluid level in the Equalization tank triggers the low float switch. This will circulate the contents of the Equalization tank to provide an overall uniform waste water sample. The sparge will remain on when the Equalization transfer pump is activated, and turn on and off on an interval basis otherwise. When the fluid level in the Equalization tank reaches the Start Level Float Switch (mid level float), it will enable the Equalization transfer pump to begin the transfer of waste water to the treatment tank. The high level float switch in the treatment tank will disable the Equalization transfer pump so no over filling will occur. There is an on delay time for the transfer pump to turn on, to effectively mix the contents of the Equalization tank.

Treatment Tank - When the fluid level of the transferred waste water in the treatment tank reaches the high float switch, the Equalization transfer pump will be shut off (preventing any over-filling). The Treatment Mixer and Recirculation/Sludge Transfer Pump will activate at the same time.

Chemical Addition - When the fluid level in the treatment tank reaches the high level float switch, it will trigger the beginning of the Chemical Feed/Mix sequence. If the Polymer Pump switch is not in auto, the chemical feed sequence will not begin.

Coagulant Addition - The chemical treatment process starts with the addition of the coagulant. The coagulant feed pump will not activate unless the Coagulant Pump Switch is in the "Auto" position. The addition of the coagulant will operate by using a Timer/Counter configuration. A sequence interval will start after the addition is complete, delaying the addition of the pH buffer. This will give ample mixing time for the coagulant.

pH buffer Addition - pH buffer addition is controlled by the pH Meter control relay A. The settings on the pH Meter will control the addition of the pH buffer, but failure to have the pH buffer Feed Switch in the "Auto" Mode will not enable the addition of the pH buffer. There is an on-delay timer that will keep the Polymer feed from starting. This timer gives the pH meter a set period of time to get an accurate reading.

Polymer Addition - The addition of the Polymer will operate by using a Timer/Counter configuration. During this part of the chemical treatment process, the Treatment Mixer and the Recirculation/Sludge Transfer Pump will shut down to prevent destruction of the chemically bonded floc. After the addition of the Polymer, the Treatment Mixer will reactivate for a set period of time to properly mix the Polymer with the rest of the waste water batch.

Treatment Cycle Over - After the additional mixing time is complete and the treatment cycle is over the "Treat Stop/Over" button will begin to flash on and off. This is the indication that the treatment cycle has been completed. A steady on light of the "Treat Stop/Over" button indicates that a process stop condition exists.

FILTER PRESS PROCESS SEQUENCE DESCRIPTIONS

Electric Ball Valve to Press - This Electric Ball Valve will rotate to open the line to the press and close the recirculation line for the treatment cycle.

Decant Directly to Filtrate - If your system is equipped with an electronic ball valve to the filtrate tank, the option exists to gravity feed the decant water directly to the filtrate tank.

Decant Directly to Press - If your system is equipped with an electric ball decanting valve on the treatment tank, the option exists to pump the decant water under a low pressure into the filter press to partially flush the filter cloths with the "separated" water from the top of the tank.

AUTO BFP WITH DTAM

Gravity Feed Sequence - The gravity feed takes place after the decant process is complete. The treated water will flow by gravity from the bottom of the treatment tank to the filter press for a preset amount of time. It will be set up with the Timer/Counter control.

Low Pressure Start - After the Gravity Feed Cycle is complete, the PLC will sequence to the next part of the program, the Low Pressure Sequence. During this portion of the program, the Sludge Pump will begin to pump the treated waste water to the filter press under a low pressure for a preset amount of time. This sequence is also controlled by a Timer/Counter control.

Strokes Monitoring and Pressure Incrementing - After the timed Low Pressure Start sequence is complete, the total number of pump strokes per minute will dictate whether the pressure will stay at its current value or stage up to the next setting in the pressure level sequence. The program will step up the pressure value when the number of pump strokes is equal to or less than the setting in the PLC.

Pressure Levels - There are seven pressure levels set up in the program to begin with, but this number can be changed as required by the process. Changing the pressure levels can be done by changing the values in the Data File N7:1 through N7:7. Please make note that the highest accepted value for the Analog Module is 31,000, which will be proportional to an output pressure level of the input pressure less 5 PSI. The ideal input pressure should be 90 PSI.

Time Interval Between Pump Strokes - At the highest pressure level the monitoring will be shifted to the time interval between strokes. If the time interval between the pump's strokes becomes greater than the set time, the PLC will enable the Filter Press Cycle Over Flasher. At this point in the press cycle the Filter Press Stop button light will begin flashing on and off to indicate that the filter press cycle has been completed.

****MAKE NOTE THAT EVEN AT THIS POINT IN THE SEQUENCE, THE FINAL PRESSURE VALUE WILL STILL BE ACTIVE AND THE PUMP MAY STILL BE PUMPING.**

High Strokes Count - Once the level of treated water in the treatment tank drops below the low float, the PLC will monitor for high strokes count. If the pump strokes over 95 times in one minute, this will indicate that the treatment tank is empty and the press cycle will shut off and the Filter Press Stop button will light.

PROCEDURE FOR OPERATION OF THE SYSTEM IN FILTER PRESS MODE

1. Press the "Press Stop/Over" Button (It will be a Red Illuminated Button)
2. Select "Press" Mode.
3. Make sure all switches on the control panel are in the "Auto" Position:
4. Reset the System by pressing both the "Press Start/On" and "Press Stop/Over" simultaneously and holding them in until the "Press Start/On" button flashes on and off for a few seconds. A flashing button will indicate that the system has been successfully reset.
5. Press the "Press Start/On" button to start the Filter Press cycle.
6. Pressing the "Press Stop/Over" button will halt the filter press cycle. To restart the operation, press the "Press Start/On" button.

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SPECIAL OPERATING INSTRUCTIONS

- * Restarting the system in the event of a power outage or disconnection while running in either process - Most of the data values and the preset figures are repetitive. So, by pressing the Process Start Button for the particular process that you are operating in, it will RE-START the sequence at the point that it was shut down

Filter Press Opening:

After the air pressure to the sludge pump has increased to 80-90 psi for several hours the press should be full. The Filter Press Stop/Over light will be flashing. Also, the water flow exiting the press will be minimal when the press is ready to be dumped. Try to avoid dumping the filter press early as this will result in wet filter cakes and lead to the cloths on the filter plates becoming soiled (dirty) more quickly and cleaning of the filter cloths may be more frequently required.

To empty the filter press:

- Push the press stop/over (red) button. This will close the transducer.
- Turn the sludge pump off.
- Close the filter press inlet valve.
- Open the air valve to allow air into the press. Note: Air regulator should be set at 20 - 30 psi. Close any valves that would allow the air to flow directly to the filtrate tank. Allow air to flow through press for 10-15 minutes. Close air valve.
- Release pressure from hydraulic RAM and remove pressure from hydraulic closure by placing the switch in the retract position.
- Separate the plates and allow the solids to drop into the sludge carts.
- When filter press is empty, line up the filter plates and switch hydraulic pump to extend position.
- Open press inlet valve and any valves that were closed during blowdown.
- If there is sludge left in the treatment tank, reset the press cycle by pushing the Press Start/On and Press Stop/Over buttons together. Place the Mode Switch in the Press position and then push the Press Start/On button.

Polymer Mixing Procedure:

- Turn Polymer water addition on. This will activate the water solenoid to add water to the Polymer tank until the high level float is activated.
- Once the tank is full of water, turn the Polymer air sparge on auto. In auto, the air sparge will run for 30 minutes before shutting off. Note: If the air sparge is turned on but is not activated, turn air sparge off for 2 seconds to reset the timer and then turn it back on.
- Add Polymer to the tank with the air sparge running. Add the Polymer very slowly so it mixes properly.

Note: It is important not to overdose Polymer during recharge as this will cause the Polymer to become very thick and difficult to mix and to pump.

AUTO RFP WITH DTAM

Manual Operation of Water Treatment System

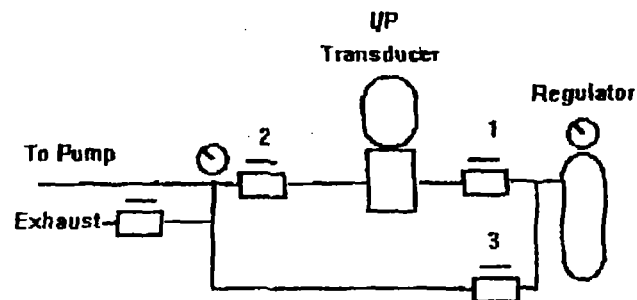
Treatment Sequence:

1. Turn Blower Motor switch to Manual.
2. Turn Equalization Transfer Pump switch to Manual.
3. When level of waste water in Treatment Tank reaches the high float, turn Blower Motor and Transfer Pump off.
4. Turn Treatment Mixer switch to Manual.
5. Use the I/P transducer bypass valving (see attached diagram) to get air to the sludge pump and recirculate the waste water at a low psi.
6. Turn the Coagulant pump switch the Manual and add the Coagulant for the preset amount of time.
7. Turn the Coagulant Pump Off and allow the tank to mix for about 1 minute.
8. Turn the pH buffer Pump switch to Manual. Allow the pH buffer to pump into the tank until the pH of the waste water is above 7.0. (The pH can be checked using the inline probe or pH paper.)
9. Turn the pH buffer Pump Off. and allow the tank to mix for about 1 minute.
10. Turn the Treatment Mixer Off and turn off the air to the sludge pump.
11. Turn the Polymer Pump switch to Manual and add the Polymer for the normal amount of time.
12. Turn the Polymer Pump Off and turn the Treatment Mixer back on for 1 to 2 minutes.

This completes the Treatment Process.

Filter Press Sequence:

1. Turn the Recirculation Electric Ball valve to the Press position. This will turn the valve from recirculation to filter press.
2. Open the I/P Transducer bypass valve to approximately 15 - 20 psi. Water should now be pumping from the Treatment Tank to the Filter Press.
3. Every 45 minutes to an hour increase the pressure to the sludge pump by 10 psi until the pump is pumping at 80 - 85 psi.
4. Allow the pump to pump at this pressure until a small trickle is exiting the press. This will indicate that the press is full.

AUTO BFP WITH DTAM

**To Bypass Transducer, Close Valves 1 and 2 and Open Valve 3
Until The Meter Reads The Desired
Pressure.**

Special Operator Maintenance

- The pH probe should be cleaned once a week. The cleaning procedure can be found in the operators manual.
- The pH probe should be calibrated every other month, or sooner if a discrepancy is found. The calibration procedure can be found in the operators manual.
- The filter clothes should be power washed approximately once a month, depending on press use and cake quality. Best results are obtained by pressure washing with warm water.

02/02/98 MON 11:45 FAX 414 656 7699

BECKART ENVIRONMENT

→→→ FRED HUGHES

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CHEMICAL	DOSAGE RATE PER 1000 GALLON	COST PER GALLON OF CHEMICAL	COST PER 1000 GALLON
Polymac 6-4622	2.5 gallons	\$5.45	\$13.36
Caustic 50% Solution	.25 gallons	\$4.00	\$1.00
Polymer B45 (concentrate diluted 240:1)	5 gallons	\$.23	\$1.15
Total estimated chemical cost per 1000 gallons treated			\$15.51

BECKART ENVIRONMENTAL, INC.

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KENOSHA, WI. 53144

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KING COUNTY
INDUSTRIAL WASTE
DATE REVISED: 2/20/94

This MSDS complies with 29 CFR 1910.1200 (The Hazard Communication Standard)

I. PRODUCT INFORMATION

PRODUCT NAME:	BECKART B-40 POLYMER
FAMILY OR DESCRIPTION:	ANIONIC FLOCCULANT
DOT HAZARD CLASSIFICATION:	Non-Hazardous
CAS NUMBER:	5001P, 64742-52-5, 64742-47-8
RCRA HAZARD CLASS(If discarded):	Non-Hazardous
EPA PRIORITY POLLUTANTS:	None
HMIS RATINGS:	
HEALTH HAZARD	-1- Slightly Hazardous;
FLAMMABILITY	-1- Above 200°F;
REACTIVITY	-0- Stable

II. HAZARDOUS INGREDIENTS

(This material contains no ingredients which are known by Beckart Environmental, Inc. to be hazardous unless listed below.)

MATERIAL OR COMPONENT	(CAS #)	LIMITS IN AIR		REMARKS
		PPM	mg/m ³	
Hydrotreated heavy Napthenic Distillate	64742-52-5	T400	T1600	Osha limit(naptha)
Petroleum distillates	64742-47-8	T400	T1600	Osha limit(naptha)
Ethoxylated Alcohols; NJ Reg #99783600	5001P	ND	ND	None

As established by the American Conference of Governmental Industrial Hygienists and/or standards promulgated by the Occupational Safety and Health Administration.

III. PHYSICAL DATA

BOILING POINT:	>550 °F	SPECIFIC GRAVITY @25°C:	1.0 - 1.2
VAPOR PRESSURE:	ND	VAPOR DENSITY, (AIR=1):	ND
ODOR:	Organic	EVAPORATION RATE:	<1
APPEARANCE:	White Translucent Liquid	SOLUBILITY(in water)@ 25°C:	Soluble

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: >200 °F

FLAMMABLE LIMITS IN AIR: Unknown LOWER LEL: ND UPPER LEL: ND

EXTINGUISHING MEDIA: Use Carbon Dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Self-Contained breathing apparatus and protective clothing should be worn in fighting fires involving chemicals. Cool exposed drums or tanks with water.

UNUSUAL FIRE HAZARDS: Wetted product presents an extreme slip hazard. Pedestrian and vehicular traffic must proceed with caution where even a small amount of wet product may exist.

V HEALTH HAZARD DATA

NATURE OF PRINCIPAL HAZARD: Eye and skin irritant.
TARGET ORGANS: Eyes, skin
EFFECTS OF OVEREXPOSURE: Contact with skin or eyes will cause irritation. Vapors may irritate eyes and respiratory tract, and result in headache or dizziness.
CARCINOGENICITY: Not listed as a carcinogen by IARC, NTP, OSHA or ACGIH.
EXPOSURE LIMITS: None established for this product.
SAFETY PRECAUTIONS: Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Avoid prolonged or repeated skin contact. CAUTION: Slip Hazard. See section VII.

EMERGENCY AND FIRST AID PROCEDURES:

Eye: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
Ingestion: Consult a physician. Never give anything by mouth to an unconscious person.
Skin: Remove contaminated clothing and launder before reuse. Wash effected area with soap and water.
Inhalation: Remove to fresh air. If symptoms persist, consult a physician.

VI REACTIVITY DATA

STABILITY: STABLE: ☒ UNSTABLE: ☐
INCOMPATIBILITIES: (Materials to Avoid) Strong oxidizing material can cause a reaction.
HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or burning may produce carbon mono/dioxides and/or nitrogen oxides.
HAZARDOUS POLYMERIZATION: MAY OCCUR: ☐ WILL NOT OCCUR ☒

VII SPILL, LEAK AND DISPOSAL PROCEDURES

CAUTION: Wetted product presents an extreme slip hazard! Proceed with caution where even a small amount of wet product may exist.
ACTION TO TAKE FOR SPILLS: (Use appropriate Safety Equipment) Remove all ignition sources. Dike area to control runoff, and collect spill in appropriate container. Use an inert absorbant such as vermiculite to collect residual liquid. Then water wash area with detergent to waste treatment to eliminate slip hazard.
DISPOSAL METHOD: All local, state and federal regulations concerning health and pollution should be reviewed to determine approved disposal procedures.

VIII SPECIAL HANDLING INFORMATION

VENTILATION: Recommended general ventilation rate of, as a minimum, 10 air changes per hour.
RESPIRATORY PROTECTION (type): Canister for organic vapors/mist as required.
PROTECTIVE CLOTHING: Clean, body-covering clothing. In addition, rubber gloves, boots and apron, depending upon the exposure likely, or as required by your company.
EYE PROTECTION: Full sideshield safety glasses or goggles (ANSI Z87.1 standard)
OTHER PROTECTIVE EQUIPMENT: Eye Fountain and Safety Shower in work area. Select additional protection equipment depending on conditions of use.